

Official Course Outline Information

Course Name: Calculus I**Course Code:** MATH 1001**Version #:** V2**Instructor:** Dr. Abiy Nedie**Office:** Check Moodle**Email:** Abiyu.Nedie@norquest.ca**Phone:** [Click here to enter text.](#)**Office Hours:** See the General Course Description on Moodle**How to Contact Your Instructor:** By Email

Official College Calendar Description:

This course introduces the basic principles and fundamentals of calculus and helps students develop logical, creative- and critical-thinking, and problem-solving skills for various mathematical problems. Students will learn about rectangular coordinates, analytic geometry, transcendental functions, inverse functions, limits, continuity, derivatives and applications, Taylor polynomials, integration, and applications. The examples and problems to solve are taken from various areas, such as physics, mechanics, chemistry, energy consumption, meteorology, seismology, biology, ecology, sociology, economics, business, industry, engineering, probabilities, and statistics.

Course Overview:

This course introduces the learner to the main mathematical functions and how they are described and transformed to obtain new functions; descriptive, graphical, numerical, and algebraic meaning of the limits, infinity, and continuity of functions; descriptive and algebraic meaning of derivatives, differentials, and rates of change in math and science; differentiating all the basic functions and inverse functions by applying differentiation rules and implicit differentiation; applying differentiation to investigate the shape and minimum and maximum points of a function; finding derivatives of indeterminate functions; applying first and second derivatives to investigate the shape of functions and their local minimum, maximum, and inflection points; antiderivatives and applying differentiation to optimization problems; definite integrals as sums of areas and the fundamental theorem of calculus; indefinite integrals, their relation to definite integrals,

This course adheres to all college policies (see the college calendar).

and the application of both definite and indefinite integrals in math, natural and social sciences, economics, and engineering; the application of integration to calculate areas between curves and the volumes of solids of various shapes, size, and orientation.

Credits: 3

Prerequisites: Math 30-1 or Math 30-2

Co-Requisites: None

Total Course Hours: 61 Hrs

Structure of Hours: Lecture: 48 hrs Lab: 13 hrs Other: 0 Hrs

Note: *Course hours are based on the number of credits. Students may need to budget two to three times this number of hours to complete the course successfully.*

Total Number of Weeks: 15

Course Meeting: Singhmar: Lecture 3-101 and Lab: 3-110

Delivery Mode: HyFlex

Faculty: Faculty of Arts and Sciences

Department: Faculty of Arts and Sciences

Program: University Transfer

Course Goals/General Learning Outcomes:

Upon successful completion of this course, students will be able to

1. Apply polynomial, exponential, logarithmic, hyperbolic, trigonometric, and inverse functions
2. Define limits, continuity and infinity of mathematical sequences and functions, and function domains and ranges
3. Explain tangent lines, slopes, and rules of differentiations
4. Determine maximum, minimum and mean values, and the shape of graphs by differentiation
5. Calculate areas, distances, and volumes by integration
6. Explain the relationship between derivatives and definite integrals
7. Solve various mathematical, physical, and statistical problems by derivation and integration

Course Units/Topics:

This course consists of the following units/topics:

1. Functions and Models
2. More Functions, Old and New Functions
3. Limits and Continuity
4. Derivatives and Differentiability
5. Differentiation Rules
6. More on Differentiation
7. Differentiation and Shapes of Graphs
8. More Applications of Differentiation
9. Antiderivatives and Integrals, Definite Integrals
10. More on Definite Integrals, Indefinite Integrals
11. Useful Techniques of Integration, Areas and Volumes

Required Textbooks, References, Materials:

Stewart, J., Clegg, D., & Watson, S. (2021). *Calculus: Early transcendentals*. Boston, MA: Cengage Learning.

Stewart, J., Clegg, D., & Watson, S. (2021). *Student solutions manual for Stewart/Clegg/Watson's Calculus: Early transcendentals. (9th ed.)* Boston, MA: Cengage Learning. E-book

Recommended Resources:

See above.

Course Evaluation:

Mark distribution for the course will be as follows:

Midterm 1	20%
Midterm2	20%
Midterm3	20%
Final Exam	40%
Total	100%

This course adheres to all college policies (see the college calendar).

Passing Level/Grading Scale:

Grades for each component will be added together at the end of the term. The final total will be translated to NorQuest College's four-point grading scale below.

Marking and Grade Conversion

Letter Grade (post-secondary programs)	Grade Point Value (post-secondary programs)	Percentage Scale (Alberta Education courses / preparatory)	Description
A+	4.0	95–100	
A	4.0	90–94	Excellent
A–	3.7	85–89	
B+	3.3	80–84	
B	3.0	75–79	Good
B–	2.7	70–74	
C+	2.3	67–69	
C	2.0	64–66	Satisfactory
C–	1.7	60–63	
D+	1.3	55–59	
D	1.0	50–54	Poor
F	0.0	0–49	Failure

Inclusive Culture:

A NorQuest education is inclusive, and our students are supported and prepared to meet the needs of a diverse society with hands-on training with people from a variety of cultures, religions, and genders. For some students, this may challenge your values and beliefs. We understand and have supported many students to stretch their comfort zones to find a balance between job success and cultural or religious beliefs.

During your programs, classrooms, labs, clinical work, and practicums, you will encounter and work with individuals

- From other cultures and religious backgrounds
- Who identify as female, male, or non-binary
- Who identify as part of the 2SLGBTQIA+ community
- Who have special considerations or restrictions around clothing and jewellery
- With disabilities
- From a different socio-economic class, caste, and/or income level
- Who may differ significantly in age

At NorQuest College, we are committed to fostering a space where both students and staff can engage in honest conversations in a respectful, responsible, and thoughtful manner without fear of repercussions. We celebrate our differences, and we value continuous growth and learning from each other. We create a sense of belonging where we do not judge anyone based on gender identity or expression, biological sex, sexual orientation, race/ethnicity, religion, linguistic and/or cultural background, age, physical or mental ability, or any other aspect of one's person. NorQuest does not tolerate bullying, racism, or harassment. If you or another student or staff member are subjected to any of these actions, your voice will be heard and taken seriously. It is everyone's responsibility to nurture a space where each person can feel safe and respected.

NorQuest College is committed to providing an environment that expects and promotes ethical behaviour in all aspects of college activities. This includes ensuring that employees, learners, and volunteers can confidentially and without fear of retaliation seek advice and/or disclose alleged wrongdoing or improper activity. The Office of Safe Disclosure is a new addition to the college and provides a safe space to hear NorQuest community members' equity, human rights, and discrimination concerns, and other reports of wrongdoing or improper activity. All learners, employees, and other members of the NorQuest community are welcome to access these services.

To access the Safe Disclosure Office, individuals are encouraged to make an appointment to meet with an advisor by emailing disclosure@norquest.ca.

Anti-Racism Statement

NorQuest College is working towards becoming an anti-racist institution. As such, we are making efforts to develop anti-racist curriculum and classroom learning experiences. This means using resources from multiple perspectives and equity deserving groups, learning from each other's lived experiences, and discussing anti-racism in our classrooms.

Integrating an anti-racist approach in the way we frame and implement courses and programs is central to achieving our desired state as an institution. It aligns with our college vision and *Deans' Joint Commitment to Anti-Racism for Equity*. Embedding anti-racism in teaching and learning practice will contribute to anti-oppressive and equitable learning experiences and outcomes for all learners. Everyone is invited to play their role for our learners to succeed in a diverse and multicultural learning space, workplace, and society.

Skills of Distinction:

At NorQuest College, learners develop Skills of Distinction as a part of belonging to the NorQuest community. Through the Circle of Courage, learners build competence in Resilience, Inclusion, and New Ways of Thinking. These human skills prepare all learners for the changing workforce and the changing world.

Course Policies and Expectations:***Statement of Conduct and Expectations***

NorQuest College is committed to maintaining high standards of non-academic and academic performance and integrity in order to foster a learning environment conducive to the personal, educational, and social development of its students. This commitment is founded upon the principles of fairness, trustworthiness, honesty, respect, and responsibility. The college expects that its students will be guided at all times by these principles in the work that they submit and the behaviour in which they engage.

It is the student's responsibility to be familiar with and follow NorQuest College policies and procedures, including the [Student Code of Conduct](#). Student policies can be viewed on the college website at <https://www.norquest.ca/resources-services/student-life/student-policies.aspx>. Policies specific to a program will be in the student program manual. If you have questions, please ask your instructor or tutor.

Academic Integrity

NorQuest College is committed to maintaining high standards of academic performance and integrity, and it is the responsibility of all members of the college community to uphold these standards. Academic misconduct may be defined broadly as the giving, taking, or presenting of information that dishonestly aids an individual or group in the determination of academic merit or standing. Common examples include, but are not limited to, plagiarism and cheating, which includes the unethical use of generative artificial intelligence (AI) tools. Allegations of academic misconduct are serious and may lead to sanctions such as mark reduction, course failure, or withdrawal from the course or program.

This course adheres to all college policies (see the college calendar).

Plagiarism

Plagiarism is a form of academic misconduct that occurs when someone presents, as one's own, work that has been created by another. It is a serious offence and can result in suspension or expulsion from the college.

There is no tolerance for academic misconduct in this course. Any student caught plagiarizing will be penalized, and the incident will be recorded in the student's file. Multiple offences may result in the student's withdrawal from the course and/or the program. Students are encouraged to familiarize themselves with the NorQuest College [Student Judicial Affairs Policy](#) and avoid any behaviour that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts, and/or participation in an offence.

Student Misconduct

[Academic misconduct](#) may be defined broadly as the giving, taking, or presenting of information that dishonestly aids an individual or group in the determination of academic merit or standing. Common examples include, but are not limited to, plagiarism and cheating.

[Non-academic misconduct](#) may be defined broadly as any behaviour that adversely affects the learning of others or the college's educational mission, violates civil or criminal statutes, threatens the safety or well-being of members of the NorQuest community, or violates the ethical standards set by professional associations or the workplace standards set by practicum, clinical, or volunteer placement agencies.

Allegations of academic or non-academic misconduct will be adjudicated according to Student Judicial Affairs Policy and procedures, and may result in sanctions ranging from mark reduction, remediation, course failure, or withdrawal from the course or program. For more information, please talk to your instructor or contact the Office of Student Judicial Affairs at osja@norquest.ca

Attendance Policy

Students are expected to attend lectures and labs at designated time and locations.

Learning Technologies

This course uses Moodle, NorQuest College's online learning management system, for course materials (<http://myclass.norquest.ca>). Upon registration, you will receive login information via your MyMail account. Course materials may include review materials, handouts, course outline, PowerPoints, notices from your instructor, schedule of readings, assignments, and exams. It is important that you log in and review the course materials and information regularly. For technical support, refer to this link:

This course adheres to all college policies (see the college calendar).

<http://www.norquest.ca/resources-services/resources/student-tools-support/moodle-support.aspx>

Student Support

Students who have a disability affecting mobility, vision, hearing, learning, or mental or physical health and who require accommodations in this course are advised to discuss their needs with a Student Support Specialist at NorQuest College [Student Services](#).

Technology and Electronics Policy

For many learning activities, laptops, smartphones, and other electronic devices are valuable learning tools. Your instructor will identify times when the use of these devices is not appropriate.

How to Submit Assignments

Your instructor will provide specific submission instructions for each assignment.

Late Assignment Submissions

Late assignments will be deducted <20%> per day, including weekends.

Course Schedule:

Please note that this schedule is subject to change. Any changes or cancellations will be emailed to you. It is your responsibility to check your NorQuest email account for relevant messages.

Date / Class	Unit / Topic	Readings	Assessment
Date: 10 Jan 2024	Course Introduction	Course Outline (Moodle)	
NO MATH 1001 Labs Dates: 08-12 Jan 2024			
Lecture 1 (2 classes) Date: 17 Jan 2024	Unit 1. Functions and Models	• Chapter 1: Sections 1.1-1.4 (textbook)	
Lab 1 (1 class) Date: 18 Jan 2024	Unit 1: Essential Functions	• Chapter 1: Sections 1.1-1.3 (textbook exercises)	Homework (not for marking)
Lecture 2 (2 classes) Date: 24 Jan 2024	Unit 2. More on Functions, Old and New Functions	• Chapter 1: Sections 1.4-1.6 (textbook)	
Lab 2 (1 class) Date: 25 Jan 2024	Units 2: Transformation of Functions. Exponential, Logarithmic, Inverse Functions	• Chapter 1: Sections 1.4-1.6 (textbook exercises)	Homework (not for marking)
Lecture 3 (2 classes) Date: 31 Jan 2024	Unit 3. Limits and Continuity	• Chapter 2: Sections 2.1-2.6 (textbook)	
Lab 3 (1 class) Date: 01 Feb 2024	Unit 3. Calculating Limits, Finding Asymptotes	• Chapter 2: Sections 2.1-2.6 (textbook exercises)	Homework (not for marking)

This course adheres to all college policies (see the college calendar).

Lecture 4 (2 classes) Date: 07 Feb 2024	Unit 4. Derivatives and Differentiability	<ul style="list-style-type: none"> Chapter 2: Sections 2.7–2.8 (textbook) 	
Lab 4 (1 class) Date: 08 Feb 2024	Units 4. Finding Rates of Change, Calculating Derivatives	<ul style="list-style-type: none"> Chapter 2: Sections 2.7–2.8 (textbook exercises) 	Homework (not for marking)
Lecture 5 (2 classes) Date: 14 Feb 2024	Unit 5. Differentiation Rules	<ul style="list-style-type: none"> Chapter 3: Sections 3.1–3.4 (textbook) 	
Midterm Exam 1 (1 class) Date: 14 Feb 2024	Units 1–4	<ul style="list-style-type: none"> Chapter 1: Sections 1.1–1.6 Chapter 2: Sections 2.1–2.8 (textbook) 	Exam (20%)
Lecture 6 (2 classes) Date: 21 Feb 2024	Unit 6. More on Differentiation	<ul style="list-style-type: none"> Chapter 3: Sections 3.5–3.6, 3.8, 3.11 (textbook) 	
Lab 5 (1 class) Date: 22 Feb 2024	Units 5 & 6. Applying Differential Rules, Implicit and Logarithmic Differentiation, Growth & Decay	<ul style="list-style-type: none"> Chapter 3: Sections 3.1–3.6, 3.8 (textbook exercises) 	Homework (not for marking)
Lecture 7 (2 classes) Date: 28 Feb 2024	Unit 7. Differentiation and Shapes of Graphs	<ul style="list-style-type: none"> Chapter 4: Sections 4.1–4.3 (textbook) 	
Lab 6 (1 class) Date: 29 Feb 2024	Unit 7. Min and Max Values, Increasing and Decreasing, Concavity, Sketching Graphs	<ul style="list-style-type: none"> Chapter 4: Sections 4.1–4.3 (textbook exercises) 	Homework (not for grading)
Lecture 8 (2 classes) Date: 05 Mar 2024	Unit 8. More Applications of Differentiation	<ul style="list-style-type: none"> Chapter 4: Sections 4.4–4.5, 4.7–4.8 (textbook) 	
Midterm Exam 2 (1 class) Date: 06 Mar 2024	Units 5–7	<ul style="list-style-type: none"> Chapter 3: Sections 3.1–3.6, 3.8 Chapter 4: Sections 4.1–4.3 (textbook) 	Exam (20%)
Lecture 9 (2 classes) Date: 12 Mar 2024	Unit 9. Antiderivatives and Integrals, Definite Integrals	<ul style="list-style-type: none"> Chapter 4: Section 4.9 Chapter 5: Sections 5.1–5.2 (textbook) 	
Lab 7 (1 class) Date: 13 Mar 2024	Units 8 & 9. The l'Hospital's Rule, Newton's Method, Antiderivatives	<ul style="list-style-type: none"> Chapter 4: Sections 4.4, 4.8, 4.9 (textbook exercises) 	Homework (not for grading)
Lecture 10 (2 classes) Date: 19 Mar 2024	Unit 10. More on Definite Integrals, Indefinite Integrals	<ul style="list-style-type: none"> Chapter 5: Sections 5.2–5.4 (textbook) 	
Lab 8 (1 class) Date: 20 Mar 2024	Units 9 & 10. Solving Definite and Indefinite Integrals	<ul style="list-style-type: none"> Chapter 5: Sections 5.1–5.4 (textbook exercises) 	Homework (not for marking)
Practice (2 classes) Date: 26 Mar 2024	Units 8–10	<ul style="list-style-type: none"> Chapter 4: Sections 4.4–4.5, 4.7–4.9 Chapter 5: Sections 5.1–5.4 (textbook) 	

This course adheres to all college policies (see the college calendar).

Midterm Exam 3 (1 class) Date: 27 Mar 2024	Units 8-10	<ul style="list-style-type: none"> Chapter 4: Sections 4.4-4.5, 4.7-4.9 Chapter 5: Sections 5.1-5.4 (textbook) 	Exam (20%)
Lecture 11 (2 classes) Date: 02 Apr 2024	Unit 11. Useful Techniques of Integration, Areas and Volumes	<ul style="list-style-type: none"> Chapter 5: Section 5.5 Chapter 7: Section 7.1 Chapter 6: Sections 6.1-6.2 (textbook) 	
Lab 9 (1 class) Date: 03 Apr 2024	Unit 11. Integration by Substitution Rule and by Parts, Calculating Areas and Volumes	<ul style="list-style-type: none"> Chapter 5: Section 5.5 Chapter 7: Section 7.1 Chapter 6: Sections 6.1-6.2 (textbook) 	
Practice (2 classes) Date: 09 Apr 2024	Units 1-11	<ul style="list-style-type: none"> Chapters 1-7 	
Final Exam (TBD) Date: Apr 2024	Units 1-11	<ul style="list-style-type: none"> Chapter 1: Sections 1.1-1.6 Chapter 2: Sections 2.1-2.8 Chapter 3: Sections 3.1-3.6, 3.8 Chapter 4: Sections 4.1-4.5, 4.7-4.9 Chapter 5: Sections 5.1-5.5 Chapter 6: Sections 6.1-6.2 Chapter 7: Section 7.1 (textbook) 	Exam (40%)

Final Exam Date and Location: TBD

Bring to Final Exam: Student ID, standard scientific calculators, pens and scrap paper

Additional Information:

Homework: At the end of each lab class, students may be assigned homework. The homework is not for credit and will not be marked, however, it is highly recommended that the students do it timely, on their own time, for the purposes of better preparation and mastering the material. For the same reason, students are also encouraged to solve as many problems as possible at the end of each covered in lectures unit/chapter/topic of the required/recommended resources above.

Exams: Hyflex students have two options for their (midterm or final) exams. One option is to write in person in class, at the designated location and during the designated time. The other option is to write the exam online, at their own convenience, but within the designated time window at the specified exam day. Unlike the option to write in person, which is free of charge, the option to write online should be only via ProctorU, which is paid. Online exams without ProctorU are not allowed and will result in zero marks and/or may be considered as an academic misconduct. More details about the online exams via ProctorU will be provided by the instructor.

This course adheres to all college policies (see the college calendar).

Further to the above, please note that for this course, **all examinations (midterm and final exams) must be written in person**. As e-proctoring services may not adequately capture the complexity of these exams, in order to maintain our high standards of academic integrity and to preserve transfer credit agreements with other post-secondary institutions, **in-person examination is required for all students, including HyFlex**. If you have any concerns about this exam requirement, for example, if you do not live in Edmonton and cannot write your exams on campus, please contact your instructor or the Arts & Sciences Program Chair, Dr. Dana Wight, directly to inquire about exam accommodation. Please note that proof of address or other supporting documentation may be required. Student ID is required during all the midterm and final exams. Students must arrive punctually. If a student is late for an exam, the instructor has the discretion to decide whether or not the student will be allowed to write the exam. Once the exam has commenced, students must remain in the room for at least 30 minutes before they can leave. Only calculators approved by the instructor will be allowed in the exam room. **The exams are not open book. Any devices capable of external communication, internet, and/or taking pictures**, e.g. cellphones, smart watches, iPods, Bluetooth-enabled devices, **cannot be used for exams of any type**. Laptops, other computer devices, and Internet are not allowed during the exams of any type. Students should bring their own pens/pencils and calculators. Only standard scientific calculators are allowed. Exchanging of calculators between students during exams is not allowed. Exam booklets will be provided. Permission to use the washroom during exams is at the discretion of the instructor and may require accompaniment.

Missed Midterm Exams: A student who misses a midterm exam must contact the instructor either directly or via email at the earliest possible time, and in all cases within 24 hours of the missed exam, with a valid explanation, supported with appropriate documentation if needed. If a student's absence is excused, the student may be given a chance to write a deferred exam with the Testing Services within the next five (5) days, or the weight of the midterm exam may be transferred to the final exam. A mark of zero will be given in situations where unsatisfactory explanation and/or no supporting documentation is available.

Statement on the Use of Generative AI: Since critical reading, writing, and thinking skills are fundamental to the learning outcomes of this course, all assignments must be prepared by the student and thereby demonstrate original work. Developing strong competencies in these areas will prepare you for your future studies and careers. Therefore, use of ChatGPT or any other generative AI tools to complete assignments is not permitted and will be treated as plagiarism. Assignments containing characteristics of AI-generated text or generated solutions will not receive credit and may be reported to the OSJA for misconduct.

Originated By: Dr. Abiy Nedie

Last Revised By: Dr. Abiy Nedie

Revision Date: January 10, 2024

Approved By (Program Chair or Dean):

This course adheres to all college policies (see the college calendar).

Minimum Instructor Requirements: Master's degree, PhD preferred

Prior Learning Assessment Recognition (PLAR): N/A

Credit can be awarded for this course through PLAR

Methods of Obtaining PLAR: N/A

Transferability to Other Institutions: Bow Valley, Concordia, King's, MacEwan, U Alberta, U Regina

NOTE: Students are advised to keep course outlines in personal files for future use. These may be used to apply for transfer of credit to other educational institutions. A fee may be charged for additional or replacement copies.

Copyright © 2023, NorQuest College and its licensors. All rights reserved.
No part of this publication may be reproduced or transmitted in any form or by any means, or stored in a database and retrieval system, without the prior written permission of the publisher.